

The 6039 input module has eight channels of high performance signal-conditioning amplifier-digitizers for strain gages and bridge transducers. Each channel has programmable excitation with remote sensing, voltage and shunt calibration, programmable gain instrumentation amplifier, low pass filter and sample and hold. Outputs of the sample & hold are digitized to 16 bits then provided to the 6000 data bus. The filter is programmable providing four low-pass frequencies and wideband.

The 6039 is used with ¼, ½ and full bridge transducers, potentiometers and low-level voltage signals in demanding, dynamic measurement applications. It is particularly suited to strain gages and bridge transducers. A shielded eight-wire input provides independent excitation, sense, calibration and signal connections to the transducer. Excitation is programmable from 0 to 12 Volts with remote sensing providing regulated excitation at the transducer. The input connector also provides access to ±12 or ±15 Volt DC power.

Gain calibration may be done by voltage substitution using an external voltage standard. A calibration attenuator enables the voltage standard to be used on its highest accuracy ranges and has a post-attenuator output for accuracy verification. Two steps of bipolar resistive shunt calibration are provided for transducer calibration. Calibration and gain and zero correction can be automated using software such as Pacific's PI660. Two alarms with programmable upper and lower limits are provided.

SPECIFICATIONS

INPUT

Configuration8 channels, 2 to 8 wire with guard shield. Bridge config is programmable for ¼, ½ and full bridge. 350 Ohm completion resistor standard, alternate value may be specified.

BalanceAutomatic by program control. Balance accuracy ±0.05% of range, ±1 mV RTO. Stability ±0.02% for 8 hours, ±0.005%/°C. Range provided is 3.5 mV/V for 350 Ohm bridge.

Impedance50 Megohms shunted by 500 pF.

Protection±50 Volts differential, ±50 Volts common mode.

EXCITATION / TRANSDUCER POWER

VOLTAGE EXCITATION

VoltageProgrammable per channel from 0-12 Volts in 1 Volt ±0.1% steps, or adjustable with 3.3 mV resolution.

Current50 mA limited to 70 mA.

Regulation±0.01% for ±10% line and no-load to full-load using remote sensing.

Stability±0.01%, ±0.005%/°C.

Noise200 µV peak to peak.

MonitorCalibration mode measures excitation voltage with ±0.2% accuracy.

TRANSDUCER POWER

Voltage±12 or ±15 Volts (24V optional) jumper selectable per channel.

Current50 mA per channel, limited to 200 mA maximum per card.

ConfigurationTransducer power available on separate pins from voltage excitation.

AMPLIFIER

GainProgrammable from 1 to 5,000 in 1, 2, 3, 5 steps with ±0.05% accuracy

Gain Stability±0.01%, ±0.004%/°C.

Linearity±0.01% for gains <1,000, ±0.02% for gains 1,000 and higher.

Common Mode80 dB plus gain in dB up to 110 dB, DC to 60Hz for ±10 Volts.

ZeroAutomatic to ±1 µV RTI, ±0.5 mV RTO.

Zero Stability±5 µV RTI, ±1 mV RTO, ±1 µV/°C RTI, ±0.2 mV/°C RTO. Short term: ±2 µV RTI, ±0.4 mV RTO for 8 hours.

Source Current±10 nA, ±1 nA/°C

Noise (10 Hz)0.1 uV rms RTI, 0.5 mV rms RTO.



FEATURES

- Programmable input configuration, ¼, ½ & full bridge
- Programmable voltage excitation with remote sensing
- Additional 12 or 15 Volt transducer power
- Two-step shunt & voltage substitution calibration
- Gains 1 to 5,000 with 0.05% accuracy
- Programmable 4, 6 or 8 pole low-pass filter
- Up to 10kS/s per channel with 16-bit resolution
- Two alarms with programmable upper & lower limits

Noise (1 kHz)1.0 uV rms RTI, 0.5 mV rms RTO.

Bandwidth5 kHz for gains < 1,000 and 1 kHz for gains 1,000 and higher.

Slew Rate3.2 V/uS.

Recovery120 µS to ±0.1% for 10X overload to ±10 V.

FILTER

Type4-freq. 4-pole (standard), 2-freq. 8-pole Butterworth with wideband.

Frequency4-pole: 4 Hz, 10 Hz, 100 Hz and 1 kHz.
8-pole: 10 Hz and 1 kHz.

Noise0.5 mV rms, RTO.

OtherOther filter characteristics and cut offs available.

DIGITIZER

SampleSimultaneous, within ±50 nS channel-to-channel. Droop is less than ±0.005%.

Resolution16 bits, two's complement.

Sample RateUp to 10 kS/s per channel.

Linearity3 LSB (0.01%).

ContinuityMonotonic to 15 bits.

AlarmsTwo alarms each with programmable upper and lower limits and persistence checked on each ADC sample.

CALIBRATION

ShuntTwo step Bipolar shunt, 0.5024 mV/V and 0.245 mV/V for 350 Ohm bridge, ±0.1%. For a 120 Ohm bridge, steps are 0.17235 mV/V and 0.08402 mV/V, ±0.1%.

Voltage Subst.Alternate input for external calibration source. Programmable attenuator with steps of 1, 0.1 and 0.01, ±0.01% accuracy. Output of the attenuator is provided for verification.

ZeroAmplifier input disconnected and shorted.

MECHANICAL

MountingOccupies one slot in Series 6000 enclosure.

ConnectorsInputs use two 50-pin Type D connectors. Mating connectors supplied

Temperature0°C to +50°C operating.

ORDERING INFORMATION

6039-PF4-BU48-Ch Strain-Bridge-Position, 4-Freq, 4-Pole Butterworth Filter

6039-PF2-BU88-Ch Strain-Bridge-Position, 2-Freq, 8-Pole Butterworth Filter